



Real-Time Printed Circuit Board EMC Measurement

Agilent Technologies
and EMSCAN



Diagnose PCB electromagnetic compatibility problems fast with real-time measurements

Finding, characterizing and resolving electromagnetic compatibility (EMC) problems on printed circuit boards is a persistent design challenge for PCB engineers. Pre-compliance testing is essential to identify causes of electromagnetic interference (EMI) such as faulty component and traces. By undertaking EMC measurements on your PCBs as part of your pre-compliance testing regime you can maximize the probability of successful completion of full EMC compliance testing without additional redesign.

Identifying unintended radiators or RF leakage on high-speed, high-power, high-density complex printed circuit boards where space is at a premium is especially challenging. EMxpert from EMSCAN allows you to visualize the cause of electromagnetic interference on PCBs in real-time. The system comprises EMSCAN's patented scanner

module, a compact adaptor, spectrum analyzer and a host computer running the EMxpert software. EMSCAN's patented bench top scanner combines 2,436 loops into 1,218 H-field (magnetic) probes spaced every 7.5 mm into an electronically switched array, which provides an effective 3.75 mm resolution. The system can operate from 50 kHz to 4 GHz, enabled with optional software keys.

In use, the PCB under test is placed on the scanner to allow spectral and spatial scanning of the electromagnetic radiation emerging from the board. Spectral scanning will quickly identify suspect frequencies while spatial scanning will align these to the physical characteristics of the board. The EMxpert software provides powerful visualization and analysis tools that allows you to

- *Printed circuit board electromagnetic compatibility measurements*
- *Identify causes of electromagnetic interference in real-time*
- *PCB pre-compliance testing minimizes re-design and re-work*
- *Uses EMSCAN's patented scanner module and software with Agilent spectrum analyzers*
- *Spectral scanning identifies suspect frequencies*
- *Spatial scanning identifies source of interference*
- *Visualization software overlays RF data on physical PCB for rapid problem solving*
- *Reduces test time and number of design cycles*



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overlay the RF data onto the PCB. This facilitates the rapid identification of suspect components or traces in order to locate exactly the sources of radiation.

EMxpert can be used with a wide range of Agilent Technologies spectrum analyzers, including the N9912A FieldFox RF analyzer, the N9340B handheld spectrum analyzer and the E4402B ESA-E Series spectrum analyzers. EMSCAN can develop drivers for any Agilent spectrum analyzer equipped with gated sweep, USB, LAN or GBIP connection, remote control, and frequency counter.

The EMxpert system provides repeatable and reliable insights into why designs fail. You don't need to wait for chamber time to re-design and test by trial and error. You can rapidly diagnose even intermittent problems, which may otherwise go

undetected when using handheld or automated single probes. The system addresses emission, immunity, filtering, EMI shielding, switch mode power supply and common mode testing needs.

With EMxpert the time to diagnose pre-compliance electromagnetic compatibility problems on your PCBs can be reduced dramatically. Test times can be reduced by at least one order of magnitude and the number of design cycles can be halved. EMxpert, when used with an Agilent Technologies spectrum analyzer, allows you to diagnose your PCB design problems rapidly and cost-effectively, accelerating your time to market and reducing your EMC pre-compliance test costs.



System Components

Agilent Technologies

N9912A	FieldFox RF analyzer
N9340B	Handheld spectrum analyzer
E4402B	ESA-E Series spectrum analyzer

EMSCAN

EMxpert	EMSCAN patented scanner module, software keys available for frequency coverage from 50 kHz up to 1 GHz, 2 GHz, 3 GHz and 4 GHz
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EMxpert	Adaptor
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To learn how this solution can address your specific needs please contact Agilent's solutions partner, EMSCAN Corporation.

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EMSCAN Corporation is a world leading developer of fast magnetic near-field measurement tools.

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